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(71) Applicant *(for all designated States except US)*: **ARUM-DAUN DONG SAN CO., LTD.** [KR/KR]; 345-41 Gasan-Dong, Geumcheon-Gu, Seoul 153-802 (KR).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **MIN, Taek-ki** [KR/KR]; 1332-1203 Sinsigazi Apt., Sinjeong-6-Dong, Yangcheon-Gu, Seoul 158-773 (KR).

(74) Agent: **L & K PATENT FIRM**; 701, Dackun Bldg., 822-5, Yeoksam-Dong, Kangnam-Gu, Seoul 135-080 (KR).

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WO 2004/112678 A1

(54) Title: CINERARY URN

(57) Abstract: Disclosed herein is a cinerary urn which is designed to enhance simplicity and effectiveness in maintenance of a high-pressure or high-vacuum state of an inner capsule thereof without damage to fine powder type cremated remains stored in a chamber of the capsule, and to enable safekeeping and management of the cremated remains to be achieved in a more economical and sanitary manner without requiring installation of a charnel house with additional expensive devices or facilities, which serve to prevent contamination of the environment due to decomposition and deterioration of the cremated remains. The cinerary urn comprises a capsule formed with an inlet at a lower side of a sealed chamber defined therein, a fixing cap threadedly fastened to the inlet of the capsule, the fixing cap having a stepped portion formed at a certain height of an inner peripheral surface thereof, and a check valve centrally provided therein, a micro-filter fixed closely between the stepped portion of the fixing cap and the inlet of the capsule, and an outer cap coupled to the capsule so as to cover it.

Description

CINERARY URN

Technical Field

[1] The present invention relates to a cinerary urn, and more particularly to a cinerary urn which is designed to enhance simplicity and effectiveness in maintenance of a high-pressure or high-vacuum state of an inner capsule thereof without damage to fine powder type cremated remains stored in a chamber of the capsule, and to enable safekeeping and management of the cremated remains to be achieved in a more economical and sanitary manner without requiring installation of a charnel house with additional expensive devices or facilities, which serve to prevent contamination of the environment due to decomposition and deterioration of the cremated remains.

Background Art

[2] As well known, a cinerary urn is a container used to receive and store powder type cremated remains. Usually, such a cinerary urn is placed in a charnel house along with a memorial tablet for paying respect.

[3] Meanwhile, since cremated remains stored in a cinerary urn are gradually decomposed and deteriorated with the passage of time, and give out a bad smell, they act as a cause of environmental contamination. For this reason, a charnel house essentially requires various devices or facilities capable of minimizing decomposition and deterioration of cremated remains, but installation of these devices or facilities results in a huge cost burden as well as a waste of time.

[4] Recently, in addition to such various devices or facilities installed in a charnel house, it has been proposed to improve the structure of a cinerary urn so as to minimize decomposition and deterioration of cremated remains stored therein. However, this solution is problematic due to trouble and inconvenience in use of the cinerary urn, and has low effectiveness.

[5] In conclusion, in order to safely store fine powder type cremated remains in a cinerary urn for a long time without decomposition or deterioration thereof, the interior of the cinerary urn should be maintained in a high-vacuum or high-pressure state. However, it is not easy to obtain such a high-vacuum or high-pressure state.

Disclosure of Invention

Technical- Solution

[6] Therefore, the present invention has been made in view of the above problems, and it is an object of the present invention to provide a cinerary urn which is designed to

enhance simplicity and effectiveness in maintenance of a high-pressure or high-vacuum state of an inner capsule thereof without damage to fine powder type cremated remains stored in a chamber of the capsule, and to enable safekeeping and management of the cremated remains to be achieved in a more economical and sanitary manner without requiring installation of a charnel house with additional expensive devices or facilities, which serve to prevent contamination of the environment due to decomposition and deterioration of the cremated remains.

[7] It is another object of the present invention to provide a cinerary urn which can efficiently cope with any external shock as well as internal pressure by virtue of a double-wall structure, thereby securing safe use thereof.

[8] It is a further object of the present invention to provide a cinerary urn which can allow a high-vacuum or high-pressure state inside a capsule thereof to be easily confirmed from the outside, thereby achieving simplicity and effectiveness in maintenance and management of the high-vacuum or high-pressure state therein.

[9] It is yet another object of the present invention to provide a cinerary urn which can eliminate a risk of explosion due to excessive pressure therein, thereby securing safe use thereof.

[10] In accordance with one aspect of the present invention, the above and other objects can be accomplished by the provision of a cinerary urn comprising: a capsule formed with an inlet at a lower side of a sealed chamber defined therein; a fixing cap threadedly fastened to the inlet of the capsule, the fixing cap having a stepped portion formed at a certain height of an inner peripheral surface thereof, and a check valve centrally provided therein; a micro-filter fixed closely between the stepped portion of the fixing cap and the inlet of the capsule; and an outer cap coupled to the capsule so as to cover it.

[11] Preferably, the check valve may include: a valve seat formed at an approximately middle height thereof, the valve seat having a valve hole centrally perforated therethrough and contoured by a downwardly tapered surface; an operating space portion above the valve seat, the operating space portion being formed at an upper side thereof with a discharge hole; a valve body elastically supported in the operating space portion by means of a spring so as to be continuously forced to close the valve hole of the valve seat, the valve body having an inverted triangular form corresponding to the downwardly tapered surface of the valve hole, and being integrally formed with a protrusion, which extends downward from a lower end of the valve body so as to penetrate the valve hole of the valve seat; and a suction aperture below the valve seat,

at an inner peripheral of the suction aperture being formed a first threaded portion. The cinerary urn may further comprise a pressure gauge adapted to be fastened to the suction aperture of the check valve. The pressure gauge may include: an upwardly-protruded entrance portion centrally formed at one surface thereof, at an outer peripheral surface of the upwardly-protruded entrance portion being formed a second threaded portion, which corresponds to the first threaded portion formed at the inner peripheral surface of the suction aperture of the check valve; and a pressure projection integrally formed inside the upwardly-protruded entrance portion, and having a plurality of through-holes.

[12] In accordance with another aspect of the present invention, there is provided a cinerary urn comprising: a capsule formed with an inlet at a lower side of a sealed chamber defined therein; a fixing cap threadedly fastened to the inlet of the capsule, the fixing cap having a stepped portion formed at a certain height of an inner peripheral surface thereof, and a check valve centrally provided therein; a micro-filter fixed closely between the stepped portion of the fixing cap and the inlet of the capsule; an outer cap coupled to the capsule so as to cover it; and a safety valve formed at one side of the fixing cap, wherein the safety valve includes: a suction bore formed at one side thereof so as to communicate with the interior of the fixing cap; a discharge hole formed at the other side thereof; a tapered contact surface conically extending rearward from the suction bore; and a ball elastically supported in a space, defined between the suction bore and the discharge hole, by means of a spring.

Description of Drawings

[13] The above and other objects, features and other advantages of the present invention will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

[14] Fig. 1 is an exploded perspective view illustrating the general configuration of a cinerary urn in accordance with the present invention;

[15] Fig. 2 is a longitudinal sectional view illustrating an assembled state of the cinerary urn shown in Fig. 1;

[16] Fig. 3 is a perspective view illustrating a pressure gauge in accordance with the present invention;

[17] Figs. 4 to 6 are sectional views illustrating the operating sequence of the cinerary urn in accordance with the present invention, Fig. 4 illustrating an injecting state, Fig. 5 illustrating a completely injected state, and Fig. 6 illustrating a mounted state of the pressure gauge;

[18] Fig. 7 is a sectional view illustrating a cinerary urn in accordance with another embodiment of the present invention; and

[19] Figs. 8 and 9 are sectional views illustrating the operating sequence of the cinerary urn shown in Fig. 7, Fig. 8 illustrating a pre-operating state, and Fig. 9 illustrating a post-operating state.

Best Mode

[20] Now, preferred embodiments of the present invention will be described in detail with reference to the annexed drawings.

[21] Fig. 1 is an exploded perspective view illustrating the general configuration of a cinerary urn in accordance with the present invention.

[22] As shown in Fig. 1, the cinerary urn of the present invention comprises a capsule 2, which internally defines a chamber (not shown) for receiving and storing cremated remains therein, and an outer cap 1 configured to cover the capsule 2.

[23] The capsule 2 is closed at its upper side by a semi-spherical upper surface, and to a lower side thereof is fastened a fixing cap 4. The interior of the capsule 2 is maintained in a high-vacuum or high-pressure state, and in order to enable visual confirmation of the high-vacuum or high-pressure state of the capsule 2, a pressure gauge 5 is mounted to the fixing cap 4.

[24] The outer cap 1 is closed at its upper side by a semi-spherical upper surface in the same manner as the capsule 2, and is configured to cover the capsule 2 through its open lower side. As the capsule 2 is covered with the outer cap 1, the cinerary urn of the present invention has a double-wall structure.

[25] Fig. 2 is longitudinal sectional view illustrating an assembled state of the cinerary urn shown in Fig. 1.

[26] Referring to Fig. 2, as stated above, the capsule 2 has the chamber 21, which is defined by an inner space of the capsule 2 and serves to receive and store cremated remains therein. The chamber 21 is closed at its upper side by the semi-spherical upper surface of the capsule 2, and at a lower side thereof is formed an inlet 22. The fixing cap 4 is threadedly fastened to the inlet 22 of the capsule 2.

[27] The fixing cap 4 is open at its upper side, and is formed with a stepped portion 42 at a certain height of an inner peripheral surface thereof under its open upper side. The stepped portion 42 serves to allow a micro-filter 3 to fixedly come into close contact with the inlet 22 of the capsule 2. The fixing cap 4 is further centrally formed with a check valve 43, and at the inner peripheral surface of the fixing cap 4 above the stepped portion 42 is formed an inner threaded portion 41. The inner threaded portion

41 of the fixing cap 4 is adapted to be threadedly fastened with an outer threaded portion 23 formed at an outer peripheral surface of the inlet 22 formed at the capsule 2.

[28] The outer cap 1, which covers the capsule 2, has a cylindrical body form wherein its upper end is closed by the semi-spherical upper surface in the same manner as the capsule 2, and its lower end forms an opening 1A.

[29] In the present invention, the pressure gauge 5 is connected to the check valve 43 of the fixing cap 4 in order to enable the internal pressure of the capsule 2 to be easily confirmed from the outside. Meanwhile, to an inner peripheral surface of the capsule 2 may be applied a coating layer, which is made of a material selected from among metal, yellow soil, clay, crystal, jade, etc. These materials are selectively usable according to their characters.

[30] Meanwhile, referring to Fig. 4, the check valve 43 has a valve seat 431 formed at an approximately middle height thereof, and an operating space portion 432 and a suction aperture 433 above and below the valve seat 431. The valve seat 431 is centrally perforated throughout a vertical height thereof with a valve hole 431A. Within the operating space portion 432 is seated a valve body 436 having an inverted triangular form wherein it is tapered from top to bottom. The valve body 436 is integrally formed with a protrusion 436B, which extends downward from a lower distal end of the valve body 436 so as to penetrate through the valve hole 431A of the valve seat 431.

[31] The valve body 436 is elastically supported at its upper side by a spring 435 so that it is continuously forced to close the valve hole 431A of the valve seat 431. The valve hole 431A of the valve seat 431 is contoured by a downwardly tapered surface 431B, conforming to the inverted triangular form of the valve body 436. At an inner peripheral surface of the suction aperture 433 is formed a first threaded portion 61, which constitutes a threading section 6 for use in the installation of the pressure gauge 5 relative to the suction aperture 433.

[32] Fig. 3 is a perspective view illustrating the structure of the pressure gauge in accordance with the present invention.

[33] The pressure gauge 5 has an upwardly-protruded entrance portion 51 centrally formed at a rear surface thereof (conforming to the upper surface of the drawing). At an outer peripheral surface of the upwardly-protruded entrance portion 51 is formed a second threaded portion 62, which will be threadedly fastened to the first threaded portion 61 constituting the threading section 6. The pressure gauge 5 further has a conical pressure projection 52, which is integrally formed inside the upwardly-

protruded entrance portion 51, and has a plurality of through-holes 53.

[34] Now, the operating sequence of the cinerary urn according to the present invention will be explained in detail with reference to the accompanying drawings.

[35] First, as shown in Fig. 4, after cremated remains are injected through the inlet 22 of the capsule 2, and the micro-filter 3 is brought in contact with the inlet 22, the inner threaded portion 41 of the fixing cap 4 is threadedly fastened to the outer threaded portion 23 of the inlet 22. In this case, the micro-filter 3 comes into close contact with the inlet 22 by means of a pressure force exerted by the stepped portion 42 in the course of fastening the fixing cap 4.

[36] In such a state, if an injection tube (P) is threadedly fastened into the suction aperture 433 of the check valve 43, the protrusion 436B of the valve body 436 is pressed according to the insertion of the injection tube (P), thereby allowing the valve body 436 to move upward by overcoming an elastic force of the spring 435. Such an upward movement of the valve body 436 results in the opening of the valve hole 431A of the valve seat 431. Thereby, through the opened valve hole 431A and a discharge hole 434 formed at the check valve 43, gas is supplied into the capsule 2, or air inside the capsule 2 is sucked toward a vacuum pump, resulting in a high-pressure or high-vacuum state inside the capsule 2.

[37] In succession, if the injection tube (P) is removed from the suction aperture 433 of the check valve 43, the valve body 436, which was moved upward by overcoming the elastic force of the spring 435, is again moved downward by receiving the elastic force of the spring 435, thereby closing the valve hole 431A as shown in Fig. 5. After completing the closure of the valve hole 431, the pressure gauge 5 is fastened to the suction aperture 433 of the check valve 43.

[38] Fig. 6 is a sectional view illustrating a state wherein the pressure gauge 5 is fastened to the check valve 43. Such a fastening is achieved as the second threaded portion 62 of the threading section 6 formed at the outer peripheral surface of the upwardly-protruded entrance portion 51 of the pressure gauge 5 is threadedly fastened to the first threaded portion 61 of the threading section 6 formed at the inner peripheral surface of the suction aperture 433 of the check valve 43.

[39] In such a fastened state, the pressure projection 52 of the pressure gauge 5 acts to push the protrusion 436B integrally extended from the lower end of the valve body 436 of the check valve 43, thereby allowing the valve body 436 to move upward by overcoming the elastic force of the spring 435. Such an upward movement of the valve body 436 results in the opening of the valve hole 431A of the valve seat 431. As a

result, the high-pressure or high-vacuum pressure inside the capsule 2 is transmitted to the pressure gauge 5 through the opened valve hole 431A of the valve seat 431 and the through-holes 53 of the pressure projection 52, thereby enabling the pressure gauge 5 to indicate the high-pressure or high-vacuum state inside the capsule 2.

[40] Fig. 7 is a sectional view illustrating a cinerary urn in accordance with another embodiment of the present invention.

[41] As shown in Fig. 7, the present embodiment features a safety valve 7 mounted at one side of the fixing cap 4. Referring to Figs. 8 and 9 illustrating the configuration of the safety valve 7 in more detail, the safety valve 7 comprises: a suction bore 71 formed at one side thereof so as to communicate with the interior of the fixing cap 4; a discharge hole 72 formed at the other side thereof so as to communicate with the outside; a ball 74 elastically supported in a space 73, defined between the suction bore 71 and the discharge hole 72, by means of a spring 75 so that it is continuously forced to close the suction bore 71; and a tapered contact surface 76 conically extending from the suction bore 71 toward the space 73.

[42] In the present embodiment, if excessive pressure is generated in the capsule 2, it affects the ball 74, which closes the suction bore 71 of the safety valve 7, so that the ball 74 is pushed by overcoming an elastic force of the spring 75, resulting in the opening of the suction bore 71. Thereby, the excessive pressure is discharged through the discharge hole 72, securing safe operation even under the excessive pressure.

Industrial Applicability

[43] As apparent from the above description, the present invention provides a cinerary urn which is designed so that a fixing cap having a check valve is fastened to an inlet of a capsule, and a micro-filter is mounted between the fixing cap and the inlet at the same time with the fastening of the fixing cap, thereby being capable of enhancing simplicity and effectiveness in maintenance of a high-pressure or high-vacuum state of the capsule without damage to fine powder type cremated remains stored in a chamber of the capsule, and enabling safekeeping and management of the cremated remains to be achieved in a more economical and sanitary manner without requiring installation of a charnel house with additional expensive devices or facilities, which serve to prevent contamination of the environment due to decomposition and deterioration of the cremated remains.

[44] Further, according to the present invention, by virtue of a double wall structure achieved as an outer cap covers the capsule, it is possible to efficiently cope with any external shock as well as internal pressure inside the capsule, thereby securing safe use

of the cinerary urn.

[45] Furthermore, according to the present invention, by installing a pressure gauge to the capsule, the high-vacuum or high-pressure state inside the capsule can be easily confirmed from the outside, thereby improving simplicity and effectiveness in maintenance and management of the high-vacuum or high-pressure state of the cinerary urn.

[46] Finally, according to the present invention, since a safety valve is mounted to one side of the fixing cap communicating with the interior of the capsule, it is possible to eliminate a risk of explosion due to excessive pressure inside the capsule, thereby securing safe use thereof.

[47] Although the preferred embodiments of the present invention have been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

Claims

[1] A cinerary urn comprising:
a capsule formed with an inlet at a lower side of a sealed chamber defined therein;
a fixing cap threadedly fastened to the inlet of the capsule, the fixing cap having a stepped portion formed at a certain height of an inner peripheral surface thereof, and a check valve centrally provided therein;
a micro-filter fixed closely between the stepped portion of the fixing cap and the inlet of the capsule; and
an outer cap coupled to the capsule so as to cover it.

[2] The urn as set forth in claim 1, wherein the check valve includes:
a valve seat formed at an approximately middle height thereof, the valve seat having a valve hole centrally perforated therethrough and contoured by a downwardly tapered surface;
an operating space portion above the valve seat, the operating space portion being formed at an upper side thereof with a discharge hole;
a valve body elastically supported in the operating space portion by means of a spring so as to be continuously forced to close the valve hole of the valve seat, the valve body having an inverted triangular form corresponding to the downwardly tapered surface of the valve hole, and being integrally formed with a protrusion, which extends downward from a lower end of the valve body so as to penetrate the valve hole of the valve seat; and
a suction aperture below the valve seat, at an inner peripheral of the suction aperture being formed a first threaded portion,
wherein the cinerary urn further comprises a pressure gauge adapted to be fastened to the suction aperture of the check valve,
wherein the pressure gauge includes:
an upwardly-protruded entrance portion centrally formed at one surface thereof, at an outer peripheral surface of the upwardly-protruded entrance portion being formed a second threaded portion, which corresponds to the first threaded portion formed at the inner peripheral surface of the suction aperture of the check valve; and
a pressure projection integrally formed inside the upwardly-protruded entrance portion, and having a plurality of through-holes.

[3] A cinerary urn comprising:

a capsule formed with an inlet at a lower side of a sealed chamber defined therein;

a fixing cap threadedly fastened to the inlet of the capsule, the fixing cap having a stepped portion formed at a certain height of an inner peripheral surface thereof, and a check valve centrally provided therein;

a micro-filter fixed closely between the stepped portion of the fixing cap and the inlet of the capsule;

an outer cap coupled to the capsule so as to cover it; and

a safety valve formed at one side of the fixing cap,

wherein the safety valve includes:

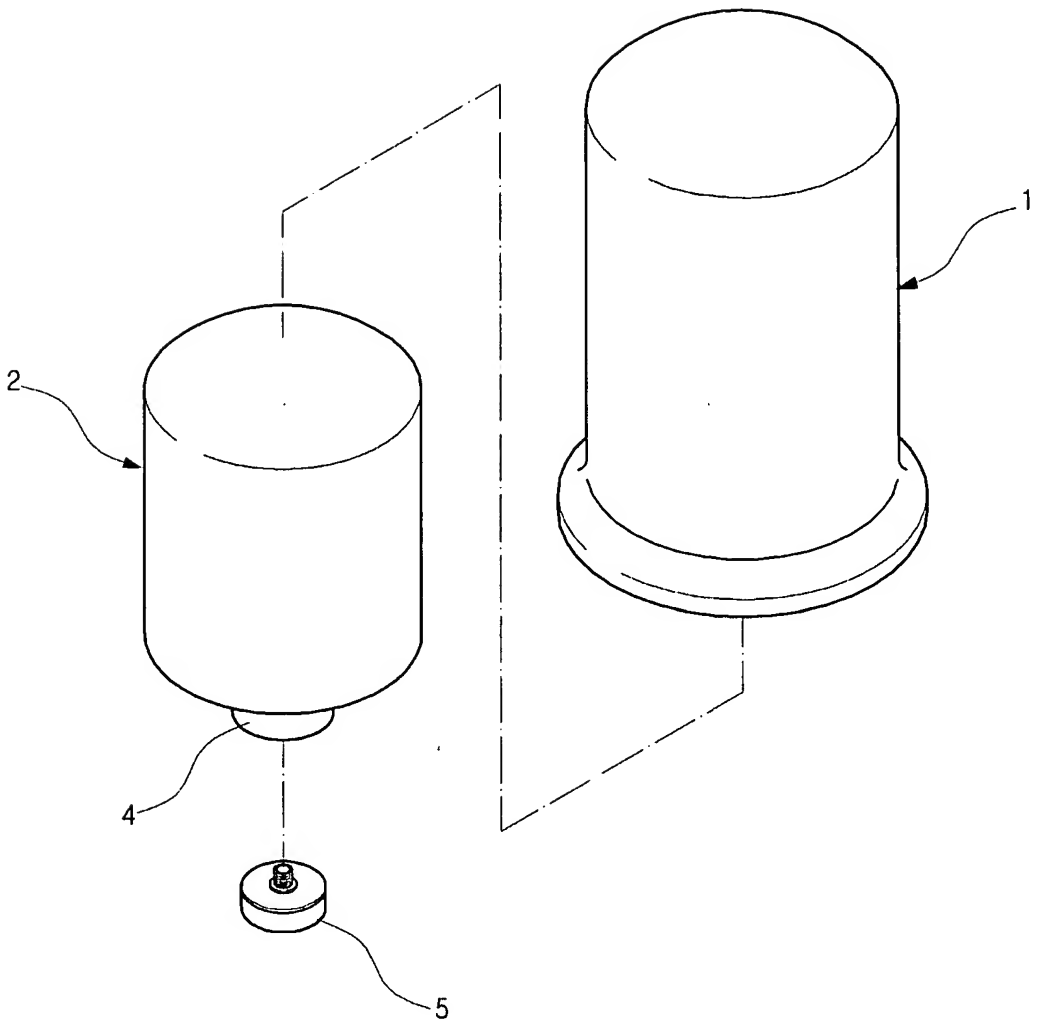
a suction bore formed at one side thereof so as to communicate with the interior of the fixing cap;

a discharge hole formed at the other side thereof;

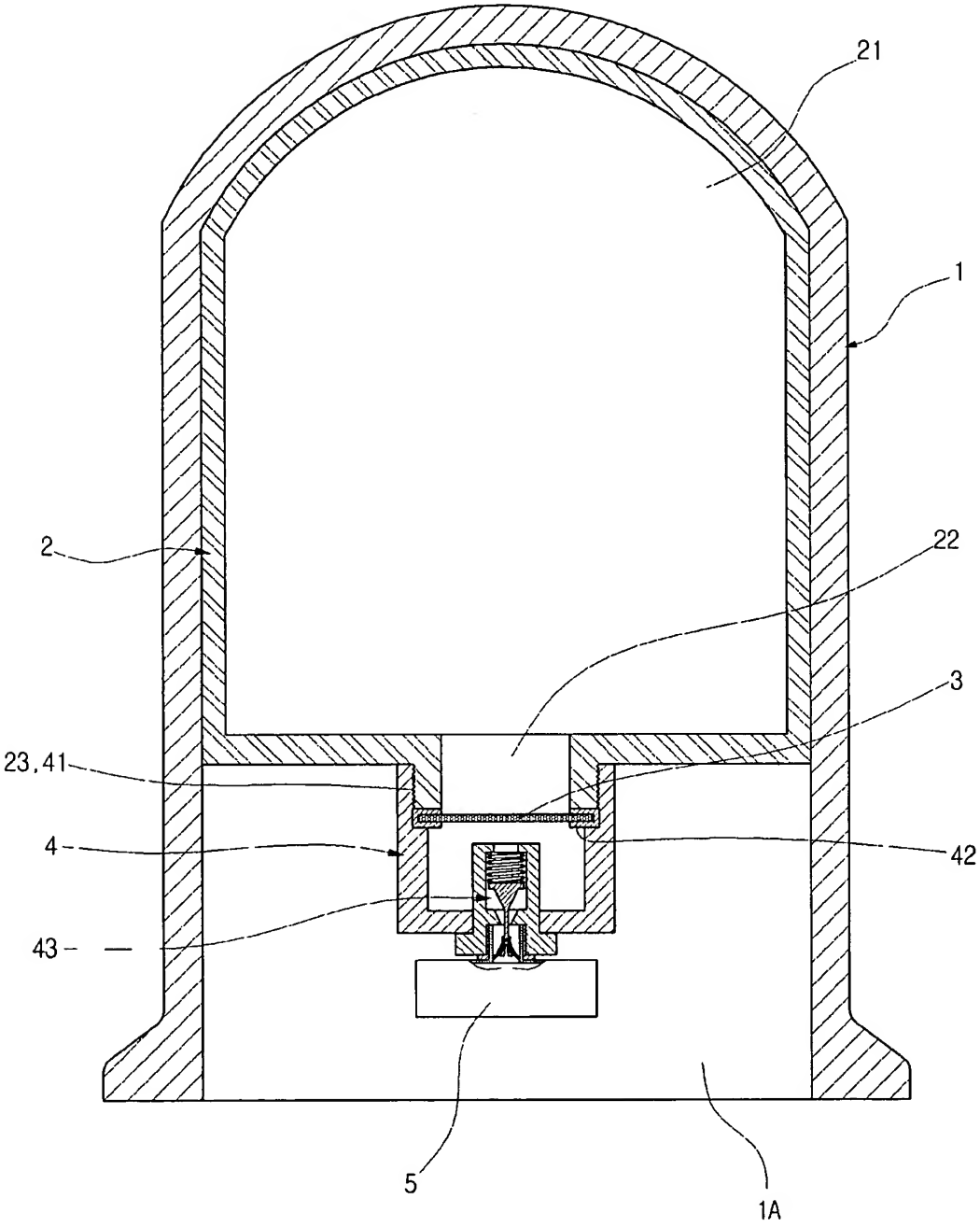
a tapered contact surface conically extending rearward from the suction bore; and

a ball elastically supported in a space, defined between the suction bore and the discharge hole, by means of a spring.

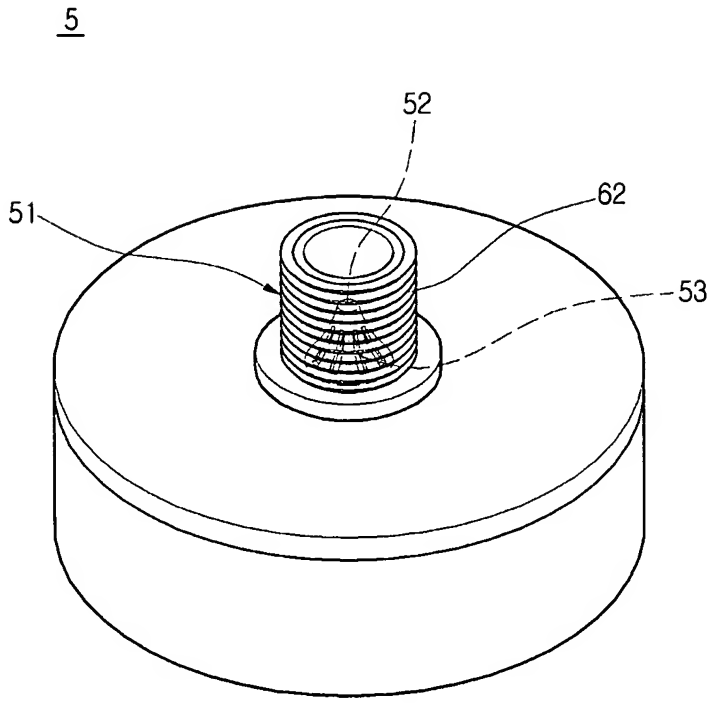
[Fig. 1]



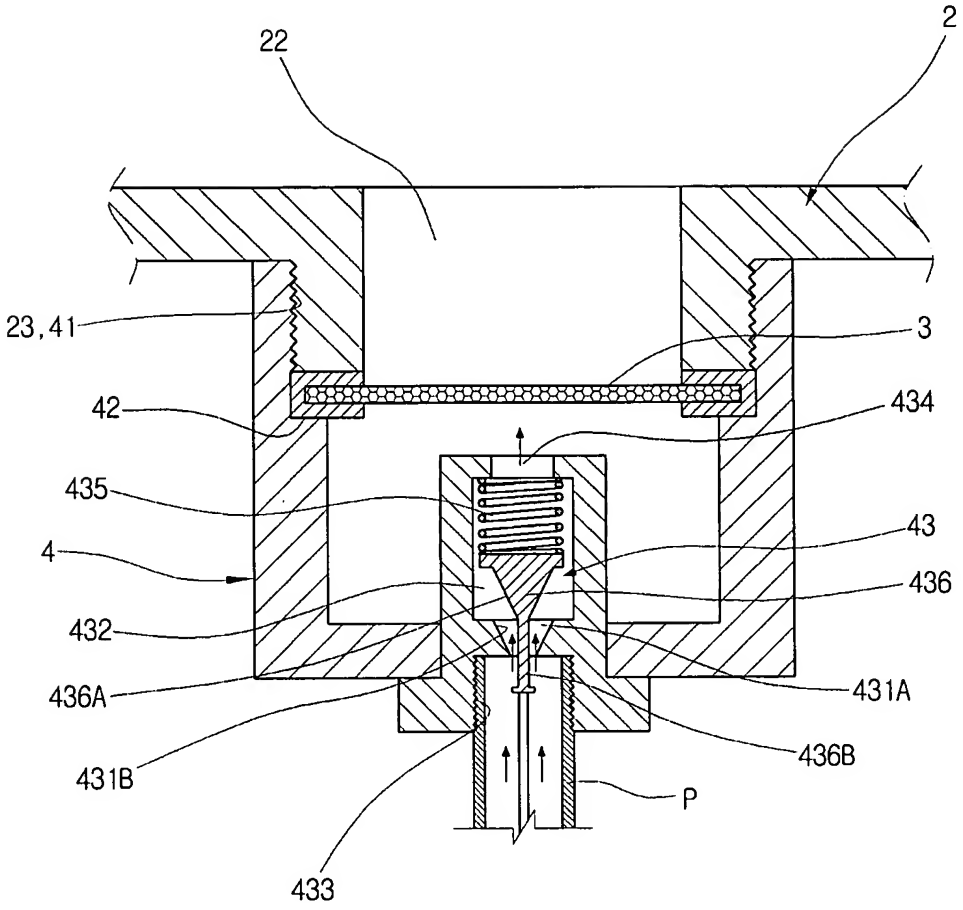
[Fig. 2]



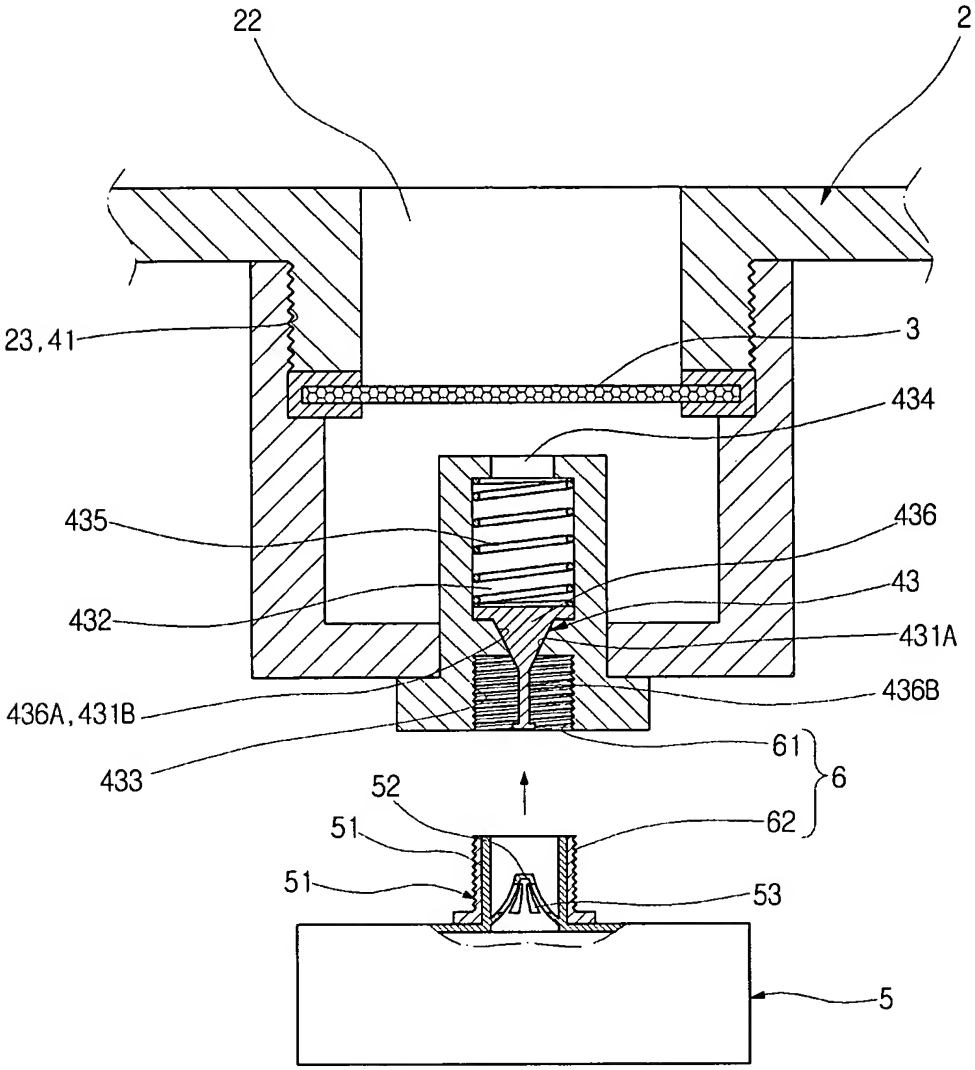
[Fig. 3]



[Fig. 4]



[Fig. 5]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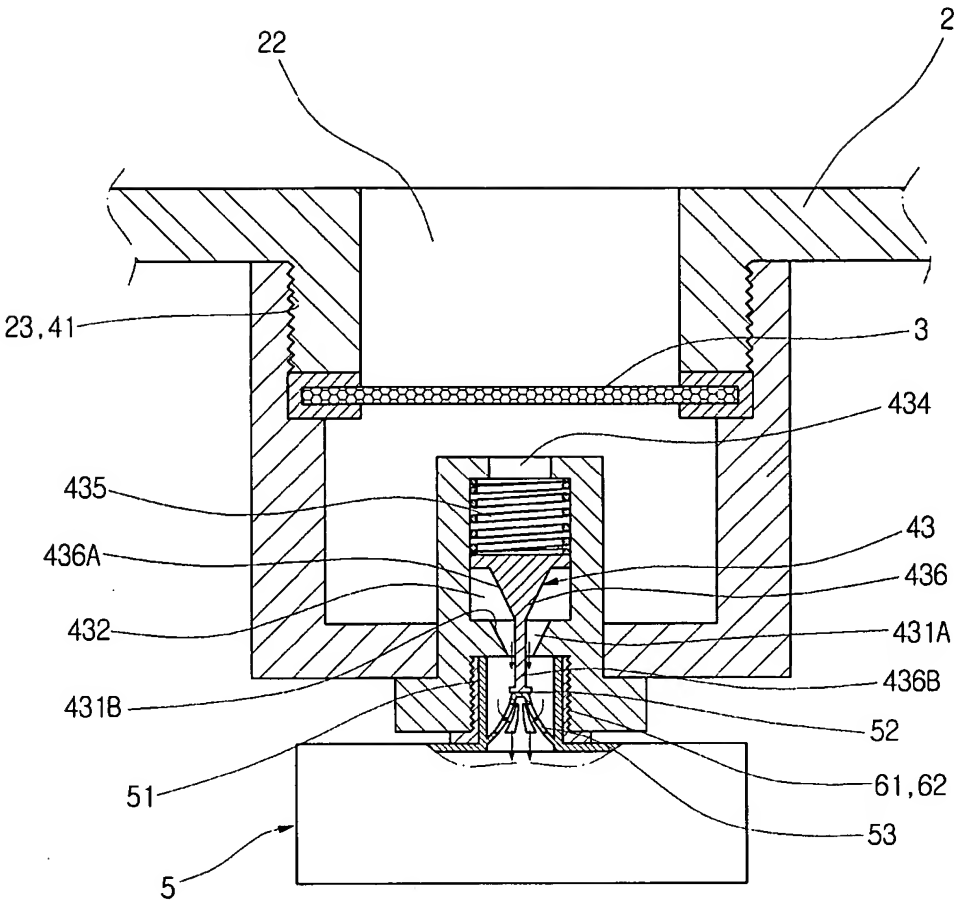
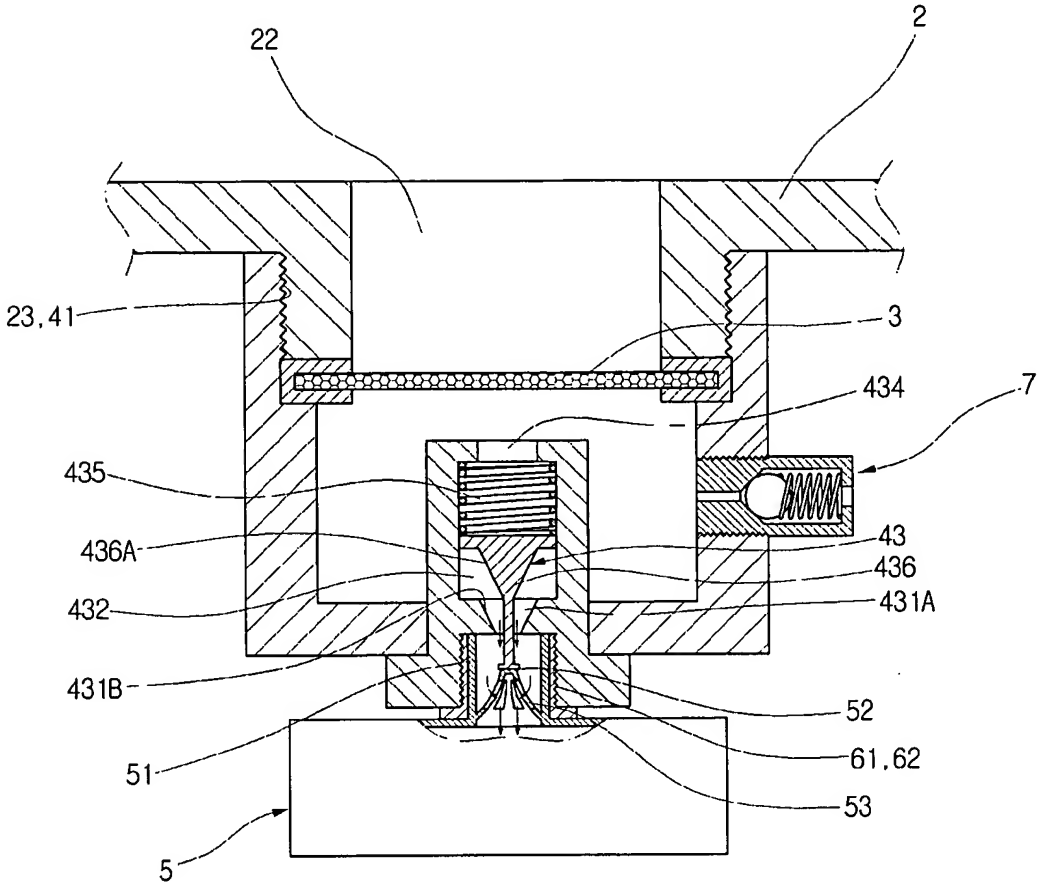
[Fig. 6]



[Fig. 7]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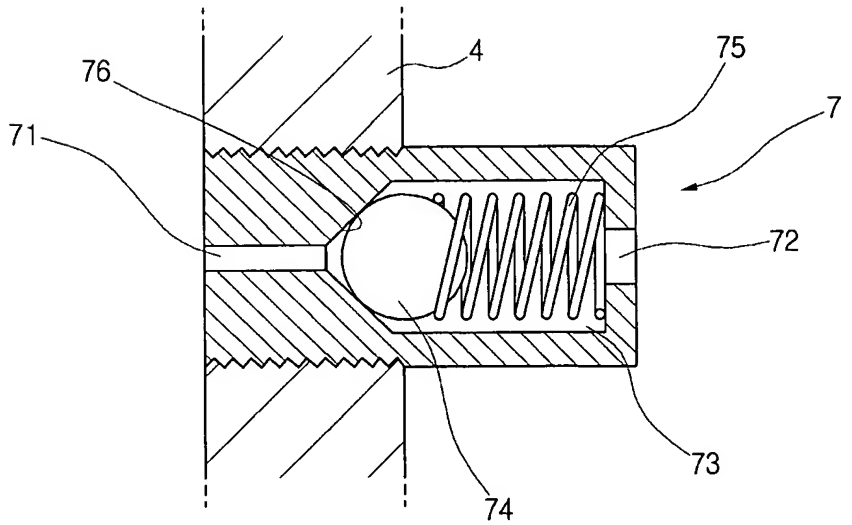
[Fig. 8]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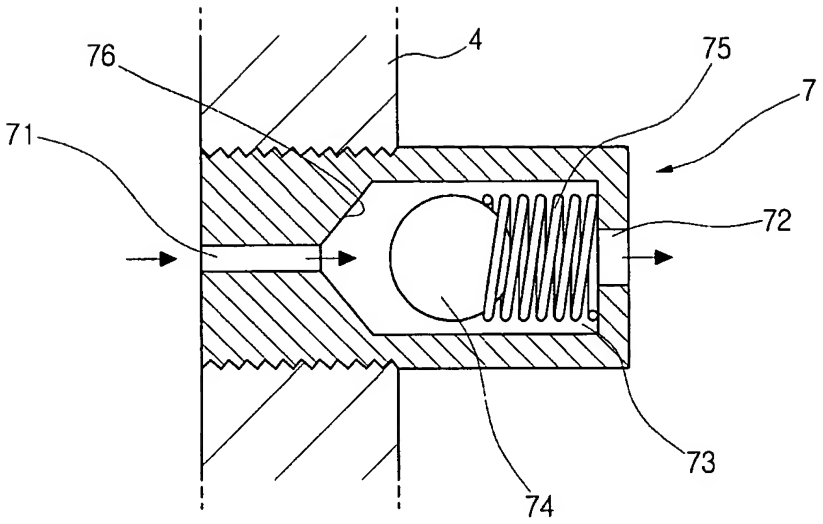
[Fig. 9]



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2004/001527

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 A61G 17/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7 A61G 17/08, F17C 1/00, 5/00, 13/00, 13/02, 13/04, B65D 81/20, 81/24

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Patents and applications for inventions since 1975
Korean Utility models and applications for Utility models since 1975
Japanese Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS : check valve, vacuum

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 2001-0256395 Y (JOO, YOUNG HO) 14 December 2001 See pages 2-3; figures 3-4	1 - 3
A	KR 2002-0095531 A (YANG, BANG WOON) 27 December 2002 See pages 2-4; figures 4-5	1 - 3
A	KR 2003-0315385 Y (HUH, OH BONG) 2 June 2003 See page 2; figure 2	1 - 3
A	JP 15-090499 A (SAMTECH CORP.) 28 March 2003 See paragraph 34; figure 1	1 - 3

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance
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Date of the actual completion of the international search	Date of mailing of the international search report
17 SEPTEMBER 2004 (17.09.2004)	**22 SEPTEMBER 2004 (22.09.2004)**

Name and mailing address of the ISA/KR

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Facsimile No. 82-42-472-7140

Authorized officer

PARK, HYUN SOO

Telephone No. 82-42-481-8114

Form PCT/ISA/210 (second sheet) (January 2004)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/KR2004/001527

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 2001-0256395 Y	14.12.2001	NONE	
KR 2002-0095531 A	27.12.2002	NONE	
KR 2003-0315385 Y	02.06.2003	NONE	
JP 15-090499 A	28.03.2003	US 2003066836 A DE 10243164 A	10.04.2003 15.05.2003

Form PCT/ISA/210 (patent family annex) (January 2004)